

**Conference on Distributed Generation and Combined Heat and Power
for Federal Facilities**

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Presentation:

“Distributed Generation in the 21st Century – Why Now, Why Here?”

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It's a pleasure to be here today. And I thank the U.S. Department of Energy for providing a great forum for federal and state representatives, industry, and international organizations to address the tremendous developments – and opportunities – in alternative energy. Alternatives include finding new methods for both power generation and delivery. A critical part of this effort will be promoting distributed energy resources – involving smaller energy-generating systems placed near a user's facility. While many Americans are familiar with solar roof panels and natural gas microturbines, there are a wide range of other distributed

energy resources on the horizon – including stationary fuel cells, energy from landfill methane recovery, small wind systems, and combined heat and power systems that are capable of using waste heat for facility heating purposes.

As a survivor of the California energy crisis, and now as a partner focusing on energy and contract issues at the law firm of Preston Gates & Ellis, I can tell you that distributed generation has tremendous business potential and also tremendous hurdles to overcome. And coming from California, we are in a unique position to address the hurdles. For those of you who are not familiar with the Golden State's reputation: we are the preeminent host to natural and man-assisted disasters – earthquakes, floods, droughts, wild fires and too many crop-destroying insects and pests to name.

As part of Governor Gray Davis' administration from 1999 until a month ago, I had the chance to serve as the Undersecretary of California's State and Consumer Services Agency – and also the Director of General Services. As my job evolved, the most important service to the public became energy, and finding solutions to the state's energy crisis. I must confess, before sharing my thoughts with you regarding distributed generation in the 21st Century, that I was a newcomer in the energy field. My journey began in the summer of 2000. Most of

the top officials in State government were on vacation when I received a phone call. A phone call from a high level government official in San Francisco that went like this: We are having rolling blackouts in San Francisco and what are you going to do about it. My reply was, “Isn’t there an office of emergency services that handles this type of thing?”

This individual replied, “You control the state facilities; I need you to operate like a power plant to relieve the pressure on the grid.” I replied, “I will take care of it and get back to you.” All the time I was thinking to myself, I don’t even know what a rolling blackout is. However, I gathered all the key representatives in the energy area throughout State government and formed a task force to address the problem. That task force became numerous task forces and resulted in the most proactive and effective energy conservation campaign in the nation known by many of you as “Flex Your Power.” The task force resulted in a sustainable building initiative unrivaled in state history that was endorsed by the legislature and the Governor.

We committed during California’s energy crisis to respond through conference calls anytime there was a threat to California’s electrical grid. We had hundreds of conferences calls, many of which occurred at 2, 3, 4 am in the morning. Thus,

you can imagine how this provided a great incentive for many of us to seek alternative energy models. We were determined to never let this happen again.

Why now? - This country has recognized that it needed to diversify domestic energy supplies for decades. But the issue came to the forefront in early 2001, when national attention was fixed on California's energy crisis, followed by the release of the President's national energy plan. The energy plan has two very basic goals that I doubt anyone would dispute: first, to promote dependable, affordable and environmentally-sound energy for the future; and second, to bring together business, government, and local communities to expand and diversify our sources of energy supply – including distributed generation.

The surge in the development of distributed generation has many of its roots in what is described as the disastrous deregulation of California's energy market and in the resulting energy crisis of two years ago. The Sacramento Bee recently set the stage this way:

"It was just before 10 a.m. on Jan. 18, 2001, when the people who operate California's electricity grid ran short of juice and started cutting off power to about 600,000 customers from Bakersfield to the Northern California border. Later that day, Governor Gray Davis declared a state of emergency, and the

State Senate voted to spend hundreds of millions of dollars in taxpayers' money to keep the power flowing as two big utilities edged toward bankruptcy.”

The reason for the rolling blackouts on that day, and on six other days during California's electricity crisis? According to the California Public Utilities Commission, five private generating companies withheld power that they should have sold into the grid. Insufficient north-south transmission capacity on “Path 15” may have exacerbated the problem. History and more than a few investigators are still evaluating the elements of this monumental melt down.

State officials – in those “dark days” of early January -- had precious little time to find a long-term cure. Immediately controlling what was within his ability, Governor Gray Davis issued an executive order to state facility managers to lead by example and reduce the state’s own electricity consumption by 20 percent.

Adversity almost always clears a path for creativity. In the months to follow – and among the mix of strides that California took – distributed generation made sense on a number of levels as we urged other users to “Flex your Power.” The conservation effort gave us the edge we needed to examine and develop longer-

term solutions. While the governor was trying to put new production **on line** as fast as humanly possible, we were also exploring ways to take the state office setting **off-line** – and beyond unplugging all non-essential equipment, we began taking a hard look at distributed generation.

The benefits would be readily recognizable. Besides reducing demand on the utility electricity grid, distributed generation would assist the effort by:

- Easing congestion at constrained transmission and distribution points.
- Deferring or reducing capital investment in transmission systems and distribution systems.
- Deferring or reducing capital investment in large centralized power generating facilities.

In times of uncertain power supplies, both the federal and state governments have unique concerns above and beyond the inconvenience created by rolling blackouts...namely, the maintenance of critical functions, including public safety. With that need in mind, California elevated the role of distributed generation, since it could provide for a stable, reliable source of electricity. In addition to easing congestion on the utility electricity grid and reducing the potential for power outages, it was considered a reliable stand-by or emergency power system for the

state's mission critical functions and processes. And, it could provide a higher quality of power for sensitive and expensive computer and communications equipment. Finally, it fulfilled one of our earlier defined long-term goals of "sustainability," generating electricity through a variety of environmentally-friendly technologies.

To date, California has installed pilot systems in three large state office buildings in the San Francisco bay area: the Public Utilities Commission headquarters, the city's Civic Center, and the Elihu Harris building in Oakland.

At the five-story, 300,000 square foot California PUC Building, we installed two 200-kilowatt natural gas fueled internal combustion engines located on the second level of the parking garage. The system has an estimated annual output of slightly more than 1 million kilowatt-hours. Plus the benefit of nearly 2 million BTUs per hour of thermal energy output for heat recovery in the building's heating and domestic hot water systems.

At the San Francisco Civic Center – our largest facility at some one million square feet -- we located four 200 kilowatt natural gas fueled internal combustion engines in the mechanical penthouse on the roof, with an estimated annual output of

nearly 6 million kilowatt hours. Additionally, the State estimates heat recovery of 4 million Btu per hour for the building's heating system and domestic hot water system as well as for operating an absorption chiller for the building's cooling system.

And across the Bay, in Oakland, we have the 742,000 square foot Elihu Harris Building, where three 200 kW natural gas fueled internal combustion engines were installed on the roof of the 23-story facility. The State anticipates an annual output of 2 million kW hours and the recovery of 3 million Btu's per hour for the building's heating system and domestic hot water system.

For the most part all of these generation units operate during "On Peak" and "Part Peak" hours as defined by the local utility. Three of the civic center units run 24/7. The California Energy Management Division says the systems reduce total peak loads on the grid of 1.8 mega watts.

The combined on-site systems in these three state facilities have not only reduced load demand but have saved taxpayers about \$80,000 annually in energy costs, so far.

Away from the Bay and into the hot, sunny climates of the State Capitol, the state Department of General Services also has added solar technology to its arsenal of grid alternatives. One of the largest state-owned electric roof-top projects – involving more than 3,000 PV panels was completed last August at the Franchise Tax Board headquarters. And across the street from the Capitol, more than 5,500 PV panels have been arrayed on a number of state office buildings. Because these are passive systems and subject to the availability of solar input, they are not as predictable as some other forms of distributed generation, but nevertheless play a strong role in energy efficiencies.

Why here? I've focused on California, but distributed generation is critical to the whole country. Today, the United States remains the world's undisputed technological leader. But as highlighted in the President's energy plan, we're still faced with the challenge of integrating 21st century technology into a modern, comprehensive approach for meeting this country's energy needs. Our nation's dependence on foreign sources of oil hovers at all-time highs and is expected to grow. According to Federal estimates, energy consumption is expected to grow by about 30% by 2020. High energy prices and supply shortages ultimately hurt consumers, businesses, and the prospects for economic growth.

The good news is that American ingenuity is not in short supply. Cleaner, more efficient technologies and energy systems are in use. Promising alternative energy sources and systems are on the horizon. And, with the United States' leadership, new global alliances are being formed. Just last month, for example, Energy Secretary Spencer Abraham announced a new international partnership in advanced research and development that will support the deployment of hydrogen energy and fuel cell technologies. And the global community has demonstrated that it is willing to put words into action. For example, the United States has committed \$1.7 billion for the first five years of a research and development program for hydrogen, hydrogen infrastructure, fuel cells, and hybrid vehicle technologies. The European Union has committed up to 2 billion Euros to long-term research and development of renewable and hydrogen energy technologies.

One last question – what's next for distributed generation? While distributed generation surged after the deregulation of California's energy market and the resulting energy crisis, there are indications, as late as this past January, of a weakening in the resolve of private sector in pursuing distributed generation options. Electricity prices have, at least for the short term, stabilized and 2001's

rolling blackouts did not continue – or expand beyond California. This led private sector managers, and many others, to turn their attention elsewhere. With the 9/11 terrorist attacks, the war in Iraq, and economic uncertainties, capital spending is constrained and other issues are more at the top of the minds for managers.

In addition, a number of practical impediments discourage the wide application of distributed generation options. These include a lack of uniform standards for connecting distributed energy to power grids; inconsistent tax rates for energy-system purchases by consumers versus traditional energy producers; zoning and permit obstacles; environmental concerns; and, in many regions, the lack of a regulatory framework that would allow consumers to sell excess energy back to the grid.

While the list of problems may seem long, there are answers. Let me offer several examples based on my work with the State of California and now with the law firm of Preston Gates & Ellis:

- First, public-private partnerships that leverage scarce resources, promote the development of technology standards, and foster collaboration on technology and infrastructure can more easily overcome technical,

regulatory, and institutional barriers. The Energy Department's current grant programs, administered by its Fossil Energy and Energy Efficiency offices, and collaborative technical programs run by California and several other states, are a crucial part of such partnerships. I encourage you to develop your own directory of such programs.

- In addition, new regulatory approaches have been taken by some states, such as Texas, New York, and California, and municipal utilities, such as Seattle City Light, to simplify the integration of distributed energy resources into their local distribution networks. These approaches offer models that should be examined by both regulators and private industry in other states.
- Innovative contracts for energy services can be pursued with the federal government. For example, the Energy Department and Department of Defense have used "Energy Savings Performance Contracts" for more than a decade to acquire more efficient energy services at federal facilities.

Under the long-term contracts (typically with a term ranging from 10 to 25 years), payments are made from energy savings, with fixed, long-term rates that allow contractors to recoup their capital and operating costs. Legislative provisions – in the proposed Energy Policy Act of 2003 and National Defense Authorization bills – are now being considered by both the House and Senate that would extend and expand the authority of the federal

government to enter into these types of contracts. I urge you to monitor Congress's activity in this area, and work with members of your Congressional delegation to ensure that authority is extended and expanded for these types of contracts.

Ultimately, if the federal government and states decide that distributed power is a good business decision, we will see the systems being included into most of our new buildings. California, for one, could end up running the nation's most influential experiment with on-site power, with tens of millions of square feet of office space demonstrating the incredible potential of state-of-the-art technology.

Many of our nation's best minds are currently working to overcome the challenges to alternative energy and distributed power. The business opportunities are enormous, and the benefits are critical to this country's future. By ending our dependence on foreign oil, lowering emissions and improving the environment, and modernizing our energy infrastructure, we have the opportunity to achieve an improved 21st-century quality of life. I urge you to be an informed and active participant as we proceed into the next era of "Flexing our Power."